Expansion of Bladder over Abdominal Tumors, complicating Laparotomy

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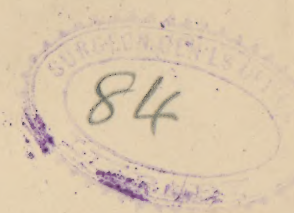
NEW YORK

REPRINT FROM VOLUME VI.

Gynecological Transactions

1882



EXPANSION OF THE BLADDER OVER THE SURFACE OF ABDOMINAL TUMORS AND ITS ATTACHMENT TO THEM OR TO THE ABDOMINAL WALLS AS A COMPLICATION OF LAPAROTOMY.

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In the whole field of surgery, general as well as special, there is no operation which, during the last thirty years, has attracted more attention, the various steps of which have been more carefully considered, and the complications attending which have been more thoroughly investigated, than ovariotomy. Not only has a very large experience been accumulated concerning it, but the results of this have been disseminated in all parts of the civilized world with a freedom which has put every practitioner who has had access to the overflowing literature of our profession in full possession of them.

It is a most striking and noteworthy commentary upon the amount of careful study and prolonged investigation required for the perfection of a capital surgical procedure, that, after all this attention to the details of this operation, even now special points still make their appearance which have thus far almost entirely escaped attention, are unknown even to men who are commonly exposing their own interests and those of their patients to the arbitrament of the knife, and information concerning which is in vain sought for in works especially devoted to the consideration of this operation and the diseased states which call for it.

An illustration of this statement is to be found in the complication to which I propose to direct the attention of

the Society to-day, the expansion of the bladder over the surface of abdominal tumors and its firm adhesion to them or to the abdominal walls.

It must not be supposed that, in this announcement of my subject, I refer to mere attachment of the bladder to tumors as the intestines, the stomach, the liver, and other viscera are attached to them by false membranes. This condition is in itself a grave complication of laparotomy, but it is a far less serious and perplexing factor than that which consists in an apron-like spread of the bladder, which is trebled or quadrupled in size, over the whole anterior surface of the tumor from the umbilicus, or a point above it downwards to the pelvis. Here not only has the surgeon to deal with an important organ attached to the tumor which he is about to remove, he finds himself shut off from contact with the tumor by the intervention of a viscus, which under these circumstances is necessarily firmly attached, which is susceptible of easy laceration by efforts to effect its detachment, and the tearing of which is very likely to entail a fatal issue. He is called, too, quite unexpectedly to manage a complication, the existence of which he had no reason to anticipate, the nature of which he is very apt not to recognize, and the presence of which is exceedingly likely to lead him into a terrible error which will seal the fate of the patient who has entrusted her life to his hands.

Search into the history of the subject furnishes us with seven cases of this character in all of which a fatal issue has been the consequence of the adhesion, either from direct injury done to the bladder, the surgeon not recognizing the nature of the complication, or from failure to remove the tumor on account of its existence. And yet in no work with which I am acquainted is this condition systematically dealt with, the surgeon put upon his guard as to the possibility of its occurrence, or rules given for his guidance, if he be so unfortunate as to be forced to face the issue. Am I not warranted then in assuming the position that in connection with the trite subject of laparotomy

for the removal of abdominal tumors there are still some points which require careful investigation and study?

As to the pathology of the condition which we are considering little need be said, for it is a perfectly simple matter. While the tumor is still so small as to be accommodated within the pelvis it becomes adherent to the bladder under those influences which produce attachments with other viscera of the abdomen, the nature of which is too well known to require consideration at our hands to-day. The tumor in time rises, and as it does so the movable bladder is dragged upwards with it out of the pelvis midway between this cavity and the navel, to the navel, and sometimes, as in a case which I shall relate to-day, midway between the navel and the ensiform cartilage. Thus to elevate the bladder filled with urine, a considerable tractile power is necessary; this makes extraordinary demands upon the attachments which unite the bladder and tumor, stimulates their nutrition and increases their strength and density. Hence it is that they have been found strong, unyielding, and difficult of laceration.

I shall now proceed to give a short sketch of all the cases of this kind of which I have been able to learn, closing with a fuller account of one which has recently occurred in my own practice and which has suggested this paper.

For the knowledge of three of these cases I am indebted to my friend, Dr. Garrigues, who has made careful search into the literature of ovariotomy in reference to the subject.

CASE I. is reported by Dr. Bergman in the "Petersburger medicinische Zeitschrift," 1869. The incision was commenced at about an inch and a half below the umbilicus and continued to three inches above the symphysis pubis. In cutting through the peritoneum the bladder was opened. The bladder lay in front of and towards the left side of the uterus, and was very much elongated, so as to be shaped like a sausage, and lay between two hemispheres of the cyst. The tumor was a polycyst firmly adherent to the linea terminalis, and could not be removed. The wound in the bladder was closed with silk sutures cut short, and

afterwards the abdominal wound was closed. Death occurred in thirteen hours.

At the autopsy both ovaries were found to contain large cysts with extensive and intimate adhesions to the intestines, iliac fascia and vessels, ureter, rectum, and vagina.

Case II. — This case appears in the "Deutsche Klinik" for 1869, and is reported by Dr. B. Stilling. The operator, upon making an incision, found no peritoneal cavity, the peritoneum having everywhere become incorporated with the tumor or the abdominal organs. The bladder, which was very much elongated and pushed over to the left side, appearing like a cyst between the intestines, was punctured by the trocar. The tumor, which was an ovarian polycyst, could only be partially removed. The wound in the bladder was closed with wire sutures, and the abdominal opening with interrupted sutures. Death occurred fifteen hours after operation. Autopsy showed the ovarian tumor to be a dermoid cyst.

Case III. — Mr. Richard Neale, of London, published the following case in the "Medical Times and Gazette," November 28, 1868.

The catheter having been introduced, an exploratory incision was made in the mesial line from one inch below the umbilicus to one inch above the symphysis. After opening the peritoneum, the appearance presented was that of another layer of altered serous membrane covering the tumor. The finger met with adhesions everywhere. The incision was carried above the umbilicus and around it, so as to avoid an umbilical hernia of the omentum, but the adhesions were so universal that no attempt at removal of the tumor was considered justifiable, and the wound was closed with silver wire sutures. The next day urine was discharged through the wound, and a long male catheter having been passed easily up to the umbilicus, was visible through the abdominal incision. It was found that an incision an inch and a half long had been made in the bladder, and the wound was covered with sponges soaked in a carbolized solution.

Twenty-six days after operation the abdominal wound, which had closed almost entirely, except just opposite the incision in the bladder, was reopened for several inches, and the thickened and everted edges of the wounded bladder were pared and brought together with fine wire sutures, and the external incision again closed.

Thirty-seven days after operation all urine was passed by urethra, except on one or two occasions, when the bladder, being overdistended, gave way in one spot, which gradually healed. The abdominal wound was closed, except over the most prominent part of the abdomen, and through the opening thus left the coats of the bladder were visible, and some moisture transuded.

The patient died six months after the operation, and an autopsy was made.

The tumor was found to be a hard fibroid in the uterus, to which organ the bladder was closely adherent. The bladder was converted into a tube eight inches in length and one inch to one and a half in diameter laterally, but the anterior and posterior coats met, being crushed between the tumor and abdominal wall. The coats were not thickened, but were thrown into rugæ capable of little if any expansion, and the bladder could not contain more than two ounces of fluid. No trace of the wound in it made at the time of operation could be discovered.

Besides these cases, Dr. Garrigues declares that Thiersch is said to have cut into the bladder drawn up in front of an ovarian tumor. The details of this case are, however, not in my possession.

Case IV. occurred in the practice of Dr. Montrose A. Pallen, and the following is his report of it: —

In the summer of 1868, whilst I was residing in St. Louis, Mrs. X., aged twenty-six, presented herself for the treatment of an enormous abdominal tumor, which was diagnosticated as a thin-walled, unilocular cyst of the ovary. The operation of ovariotomy was suggested, and an attempt made at its performance. After the division of the linea alba, and an evacuation of the sac, the pelvic adhesions were found to be so general and complete that it was impossible to differentiate the bladder from the cyst-wall. Professor John T. Hodgen strongly advised the abandonment of any attempt to separate the adhesions. I stitched the abdominal edges of the incisions to those of the cyst, literally "marsupializing" the patient, — a procedure since recommended by Professor Stimpson (of the University Medical College) as an excellent method to shrivel and contract the sac, instead of its ablation. The patient died on the fifth day of diffuse peritonitis, and an autopsy revealed complete adherence to the rectum, uterus, and bladder, which could not be overcome in the cadaver. The bladder was exceedingly large and dilated, measuring full

nine inches in its longitudinal diameter, and almost as much laterally. It presented what was deemed to be an insuperable barrier to the removal of the cyst, and led me to accept Professor Hodgen's views as to the abandonment of the operation.

CASE V. — I was requested by Dr. X. to assist him in an operation for laparotomy, undertaken for the removal of a large uterine fibroid, which equaled in size a gravid uterus at the seventh month. The usual incision through the linea alba having been made, a shining, muscular-looking mass was found extending over the tumor, and reaching up as high as the umbilicus. Very naturally, supposing this to be a thick layer of false membrane, the operator peeled it off from above, to discover, when this detachment had reached the symphysis pubis, that he held one wall of the bladder in his hand, while the other was still attached to the surface of the tumor. Having ascertained this, he quickly detached the posterior vesical wall, very skillfully sewed the two together with silver sutures, and successfully removed the large underlying tumor. The patient, however, did not rally, and death ensued a few hours after operation.

CASE VI. — This occurred in the practice of Dr. Leroy McLean, of Troy, N. Y., and was published by him in the New York "Medical Record," of February 8, 1879.

I describe the case in Dr. McLean's words. "Before proceeding to the operation, a large aspirating needle was introduced to the left of the median line, and a quantity of fluid, having the consistency and color of molasses, withdrawn. The bladder was then evacuated. The incision was commenced half an inch below the umbilicus, and extended down two and one half inches. At the lower angle of the incision, at a depth of three quarters of an inch from the surface, I cut into what appeared to be a cyst in the abdominal walls, which contained about two drachms of pale fluid. The edges of the incision did not retract as they usually do when the abdomen is tense, and not liking the indications presented, and not being thoroughly satisfied as to what we had to deal with, the incision was carried upwards to a point on a line and to the right of the umbilicus, when the unmistakable ovarian sac was reached. Using the finger as a director, the opening was completed below, and the tumor removed. Suppuration had begun in a portion of the sac. It had two strong omental adhesions, one of which necessitated the application of a ligature. The tumor was of the multilocular character. The pedicle was

secured with a silk ligature, and returned, it being too short to admit of changing. Then was discovered the condition shown in the drawing [which I do not exhibit here], and the injury done to the bladder, it having been cut through on its anterior and posterior surfaces down to the lower end of the incision. The anterior surface was strongly adherent to the abdominal wall. It was not adherent to the tumor. In completing the incision from above downwards the finger used as a director had passed behind the bladder (its walls being then in close contact from pressure of tumor behind), and the injury done as shown. The bladder was repaired with interrupted silk sutures. The adhesions of its anterior surface to the abdominal walls were not disturbed. Abdominal incision closed with silver wire.

"The patient was carried to her bed, and one hour after a soft rubber self-retaining catheter (which we were obliged to send for at some distance) introduced, and two ounces of urine withdrawn, showing that the bladder was still capable of performing that portion of its functions. The catheter was left *in situ*, the urine being thus allowed to escape as soon as secreted. Previous to the introduction of the catheter she had expressed a desire to micturate.

"At ten P. M., ten hours after the operation, her condition was good. She had rallied, but complained of feeling very tired. She expressed a desire for food. Pulse, 112; temperature, 100°. Five A. M., pulse, 125; temperature, 101°. She has begun to show evidences of approaching dissolution. She gradually sank from this hour, death occurring at seven P. M., thirty hours from time of operation. Her temperature did not at any time exceed 101⅘°. The secretion of urine was normal.

"Post mortem in the presence of Drs. Vanderveer, Ward, Snow, Edward Hun, and Schuyler. Primary union of abdominal incision; no evidence of peritoneal inflammation; the bladder intact, good primary union, and no escape of urine into the cavity of the abdomen. The effort of nature at repair beautifully shown in portion of omentum which had been ligated, — a fibrous clot had been thrown out which covered the ligature, and formed a strong adhesion of cut end to a fold of the intestine. There was no evidence of sloughing of the pedicle. The adhesions of bladder to abdominal wall so firm that they cannot be separated without tearing that viscus. The uterus was anteflexed and bound down by strong adhesions."

CASE VII. — This was a case of ovariotomy performed for the removal of a large tumor by Dr. E. Noeggerath, in Mount Sinai Hospital, in this city, in October, 1880.

I transcribe the report of the case, made by him to the New York Obstetrical Society, and published in its Transactions.

"Dr. Noeggerath operated on the 18th of October, at three P. M. Chloroform was given; but before the abdomen was opened the patient's pulse became small and irregular, and she vomited. Ether was then substituted for chloroform, and the operation was continued by cutting through the abdominal walls, when a dense layer of cellular tissue was encountered; but he was unable to find any peritoneum. He then introduced a trocar, and drew off about a pailful of true colloid material, with a large amount of fat, and then proceeded to open the tumor in such a way as to leave the trocar *in situ*, lifting the mass up and cutting on the trocar. He was then convinced that there were strong and very extensive adhesions between the mass and the abdominal walls. He continued cutting, and finally reached a cystic cavity which he incised; and after he had opened it, he found that its apex reached upwards to within two and a half inches of the umbilicus. Upon closer examination, he found that he had opened the bladder, which had been carried upwards, and become so attached to the anterior wall of the abdomen as to appear like a portion of the cyst itself. The opening was then sewed up with catgut, and the bladder was kept empty with a catheter. The operation for the removal of the tumor was then continued, when it was found that the peritoneum was considerably thickened, and that the tumor could not be separated from it, the cyst-wall and the peritoneum were so completely united that they appeared to be a single structure. He then lengthened the abdominal incision to an inch and a half above the umbilicus. Suddenly the patient became very pale, and upon close examination it was found that the large cavity of the cyst was filled with fluid blood. No bleeding vessel was discovered, but after removing all the blood there was found in one of the pouches of the tumor a very soft mass, about half as large as a kidney, which was the source of hemorrhage. How it had been injured he was unable to say. A thick ligature was thrown around the base of the mass, and the bleeding at once ceased. In the mean time the patient had become very anemic. The cutting operation was discontinued because of the extensive adhesions and the low con-

dition of the patient, and the case was further treated by simple drainage of the sac. An antiseptic bandage was applied, and the patient was removed to her bed. At first she rallied somewhat, but death occurred twenty-six hours after the operation as the result of acute anemia, complicated with septicemia. On the morning following the operation the patient's temperature had been 105° F., when twenty grains of quinine were given per rectum, and within three hours the temperature fell to 99° F. At autopsy, besides finding very extensive adhesions, it was found that the tumor had no pedicle. In its lower section the tumor was a part of the broad ligament, and therefore had the operation been continued it would have been necessary to leave the lower part of it to be treated by drainage. There was no peritonitis."

Case VIII. — I now come to the relation of the case which suggested this paper, and which embodies my personal experience in dealing with the complication of which it treats. In November, 1880, Miss C., aged about thirty-eight years, a native of Canada, entered my service in the Woman's Hospital, on account of a large multilocular ovarian tumor, and on the sixth of that month she was submitted to operation.

Making an incision of about three and a half inches in length through the median line and through the peritoneum, I discovered the surface of the tumor presenting a peculiar appearance, which arrested my hand as I was about to plunge in the trocar and canula. I then enlarged the abdominal incision, and upon careful examination I was led to suspect that the mass overlying the tumor might be the bladder. To settle this point I endeavored to pass a long catheter, but the tumor pressed so firmly against the pubes that the instrument would not pass beyond that point. Becoming more and more convinced that I had to deal with a case of extensive vesical adhesion, while at the same time I was unable to prove that this suspicion was correct, I tried to determine the points at which the bladder attached itself to the tumor, but in vain; so completely did the bladder seem amalgamated with the tumor that I could not discover where it ended in its extension over it.

I now found myself in this dilemma: there intervened between the abdominal incision and the tumor a mass which I regarded as the bladder, and which spread over on both sides to such an extent that I could not evacuate it by the trocar nor tear off the adherent organ on account of the firmness of its attachment

and my uncertainty as to the limits of the misplaced viscus. From this dilemma I endeavored in vain to escape by enlarging the abdominal incision above the umbilicus; but in this effort I was defeated by the discovery that the mass extended upwards even above this point. For a time I seriously contemplated closing the abdominal wound and leaving my patient to a fate which I felt powerless to avert. But this thought occurred at that moment to my mind: while I could not tear away the adherent bladder for fear of injuring it, I could cut the attached viscus away with ease and certainty, if I could only estimate exactly where its outward limits lay.

To accomplish this I decided to cut directly through the anterior wall of the bladder so that one or two fingers could be inserted. This I did, and at once a flood of light was thrown upon the case. Passing the index finger of the left hand into the bladder and as far as it could be carried to one side I learned exactly the extent of the viscus and cut down upon the tumor severing the strong attachments. In this way, exploring with the finger or two fingers of the left hand, cutting down at the appropriate point, and tearing adhesions after cutting, I soon freed the bladder entirely from the attachments, for there were none between the posterior wall and the tumor, but only at the circumference. A great deal of hemorrhage followed this procedure, and quite a number of ligatures had to be applied to bleeding vessels.

The bladder was so immense in weight and dimensions that it was difficult to believe in its identity, but the introduction of a long elastic catheter had before this put the question at rest. It had extended upwards to a point midway between the umbilicus and ensiform cartilage and laterally well down into the lumbar regions.

After this the trocar was plunged into the tumor and it was removed in the usual way and its pedicle cut, ligated, and returned to the peritoneal cavity.

I now found myself freed from the tumor but embarassed by the existence of an immensely hypertrophied bladder with an incision through its anterior wall. This difficulty I met by using the abdominal walls as a pair of clamps, and by their instrumentality clamping the vesical walls securely together. By this plan I succeeded in so bringing the incision in the bladder externally that if leakage did occur it would not take place into the peri-

toneum. But this procedure I must give in detail. Employing Vidal's needle, which has an eye near its extremity, I closed the abdominal wound from above downwards, and twisted the silver sutures employed until the wound was closed down to the opening in the bladder. Arrived at this point I passed the needle through the abdominal wall, then through one vesical wall, then through the other, and lastly through the opposite abdominal wall, and this I continued to do until the whole opening was traversed by sutures. The sutures were then twisted, care being taken to lift the bladder well up to the surface, and the operation was completed. A Sims' sigmoid catheter was kept in the bladder, the patient removed to bed, and the after treatment conducted upon general principles.

Convalescence was regular and rapid, the temperature reaching only 100.6° on the third day and the pulse 118 on the fourth. Slight hemorrhage took place on the second day, and two or three small vessels in the edge of the protruding bladder were caught by the artery forceps and tied, and a little persulphate of iron was applied.

The sutures were removed on the tenth day and all went well until the fourteenth day when a slight oozing of urine was discovered from an opening not larger than a cambric needle in the line of incision. This did not annoy the patient, so I did not interfere with it until the fortieth day, when she was up and walking about. At that time I twirled a small tenotome in the minute opening and passed a suture which closed it entirely.

At the end of three months the patient went back to Canada perfectly well.

Before concluding this paper, a few words concerning the diagnosis and management of this complication of laparotomy. As to diagnosis I have little to say, for I believe it to be impossible before the abdominal incision. The only method by which it could be accomplished is the use of the sound or catheter, and the value of this one who has had no experience in such cases would naturally regard as very great. In my case, employed even after abdominal incision had excited a strong suspicion as to the existence of the complication, it was entirely inefficient on account of the great size of the tumor and

the pressure which it exerted upon the bladder at the symphysis pubis. These cases are very rare, and it will readily be conceived that energetic efforts to explore the bladder will very seldom be practiced when there exists no evidence whatever that that organ is misplaced. The operator will have to depend upon his own quickness of perception and upon the careful investigation of suspicious tissue by sight, touch, the tenaculum, and the scalpel. If the bladder be attached to the tumor extensively and closely, diagnosis by these means will generally prove difficult; if it be attached to the abdominal wall it will be still more so.

As to treatment of the condition I would say that if the bladder be attached to the abdominal parietes its anterior wall will usually be cut through before the existence of the complication is even suspected, and that while this may likewise be so if it be attached to the tumor the danger of such an accident is decidedly less.

After the diagnosis is once made the adherent bladder should, if possible, be separated by digital detachment. If, as in my case, these attachments are so strong that they cannot be broken without the danger of lacerating the bladder I think that making an incision into the anterior wall of the organ, introducing the index finger as a guide to its outer limits, and then cutting through the adhesions, is the wisest course that offers itself.

If the anterior wall of the bladder has been incised, either by accident or intention, it appears to me that the plan of clamping the lips of the incision between those of the abdominal wound, as was done by myself in the last case related, promises much better results than that of sewing up the opening by sutures, and returning the repaired viscus to the abdominal cavity.